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Performance Oriented Packaging Testing of Container, Shipping and Storage, CNU-287/E for Packing Group II Solid Hazardous Materials

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6. AUTHOR(S)

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13. ABSTRACT (Maximum 200 words)

This Performance Oriented Packaging (POP) test was conducted to ascertain whether the CNU-287/E Shipping and Storage Container, modified with six cover closure straps, meets the Packing Group II requirements specified by the Code of Federal Regulations, Title 49 CFR, Parts 107 through 178, dated 31 December 1991. The packaged commodity used for the test consisted of four sand-filled steel pipe sections each weighing 93 kg (205 pounds). The total net weight was 372 kg (820 pounds). This load simulated four SIDEWINDER, AIM-9G/H/L/M Missiles. Gross weight of the loaded container was 590 kg (1,300 pounds). The test results indicate that the container has conformed to the POP requirements.

14. SUBJECT TERMS

POP Test of CNU-287/E Shipping and Storage Container

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PERFORMANCE ORIENTED PACKAGING TESTING OF CONTAINER, SHIPPING AND STORAGE, CNU-287/E FOR PACKING GROUP II SOLID HAZARDOUS MATERIALS

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September 1992

FINAL

DISTRIBUTION UNLIMITED

Sponsoring Organization:
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INTRODUCTION

This Performance Oriented Packaging (POP) test was performed to ascertain whether the CNU-287/E Shipping and Storage Container modified with additional steel strapping meets the Packing Group II requirements specified by the Code of Federal Regulations, Title 49 CFR, Parts 107 through 178, dated 31 December 1991. The packaged commodity used for the test consisted of four sand-filled steel pipe sections each weighing 93 kg (205 pounds). The total net weight was 372 kg (820 pounds). This load simulated four SIDEWINDER, AIM-9G/H/L/M Missiles. The gross weight of the container was 590 kg (1,300 pounds).

During a previous POP test of this container, the cover closures failed as a result of the drop test allowing the contents to fall out. (See Test Report DODPOPHM/USA/DOD/NADTR91024.) As a corrective measure, a total of six 1-1/4-inch steel girth straps were added to the container design prior to this test.

Due to unavailability only one container was used for testing. This is less than the number required by the regulations. Approval for this deviation has been granted by the Under Secretary of Defense, Memorandum for the Joint Logistics Commanders dated 22 February 1990.

TESTS PERFORMED

1. Base Level Vibration Test

This test was performed in accordance with Title 49 CFR, Part 178, Subpart M, Sec. 178.608. The container was placed on a repetitive shock platform which has a vertical linear motion of 1-inch double amplitude. Movement of the container was restricted during vibration in all but the vertical direction. The frequency of the platform was increased until the container left the platform 1/16 of an inch at some instant during each cycle. Test time was 1 hour.

2. Stacking Test

This test was performed in accordance with Title 49 CFR, Part 178, Subpart M, Sec. 178.606. The container was subjected to a force applied to its top surface equivalent to the total weight of identical packages stacked to a minimum height of 3 meters (including the test container). A weight of 3,537 kg (7,800 pounds) was stacked on the test container. The test was performed for 24 hours. The weight was then removed and the container examined.

3. Drop Test

This test was performed in accordance with Title 49 CFR, Part 178, Subpart M, Sec. 178.603. Five drops were performed from a height of 1.2 meters (4 feet), impacting the following surfaces:

a. Flat bottom.

b. Flat top.

c. Flat on long side.

d. Flat on short side.

e. One corner.

PASS/FAIL

1. Base Level Vibration Test

The criteria for passing the base level vibration test is outlined in Title 49 CFR, Sec. 178.608(c): No test sample should show any deterioration which could adversely affect transportation safety or any distortion liable to reduce packaging strength.

2. Stacking Test

The criteria for passing the stacking test is outlined in Title 49 CFR, Sec. 178.606(d): No test sample may show any deterioration which could adversely affect transportation safety or any distortion likely to reduce its strength, cause instability in stacks of packages, or cause damage to inner packagings likely to reduce safety in transportation.

3. Drop Test

The criteria for passing the drop test is outlined in Title 49 CFR, Sec. 178.603(f): A package is considered to successfully pass the drop tests if for each sample tested, no rupture occurs which would permit spillage of loose explosive substances or articles from the outer packaging.

TEST RESULTS

1. Base Level Vibration Test

Satisfactory.

2. Stacking Test

Satisfactory.

3. Drop Test

Satisfactory.

DISCUSSION

1. Base Level Vibration Test

The input vibration frequency was 3.3 Hz. Immediately after the vibration test was completed, the container was removed from the platform, turned on its side and inspected. No unfavorable distortion or deterioration was observed.

2. Stacking Test

The container was inspected after the 24-hour period was over. No unfavorable distortion or deterioration was observed.

3. Drop Test

After each drop, the container was inspected. The contents were completely retained by the container.

REFERENCE MATERIAL

A. Code of Federal Regulations, Title 49 CFR, Parts 107-178.

B. Bureau of Explosives Tariff No. BOE 6000K Hazardous Materials Regulations of the Department of Transportation by Air, Rail, Highway, Water including Specifications for Shipping Containers.

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TEST DATA SHEET

POP MARKING: UN 6HA2/Y590/S/**/USA/DOD/NAD **YEAR LAST PACKED OR MANUFACTURED	
Container: CNU-287/E Shipping and Storage Container	
Type: 6HA2	**Container P/N or NSN:** NSN 8E 8140-01-072-3593
Drawing Number: P/N 639AS2750	**Outer Packaging Material:** Plastic Receptacle
Dimensions: 136.00" L x 35.38" W x 18.63" H	**Gross Weight:** 590 kg (1,300 pounds)
Closure (Method/Type): Removable lid	**Tare Weight:** 218 kg (480 pounds)
Additional Description: The outer plastic receptacle is supported by a welded steel cradle	

PACKAGED COMMODITY:		
Name: See table 1	**NSN(s):** See table 1	
United Nations Number: See table 1		
United Nations Packing Group: II		
Physical State (*Solid, Liquid, or Gas*): *Solid*		
Vapor Pressure (Liquids Only): N/A	**At 50 °C:** N/A	**At 55 °C:** N/A
Consistency/Viscosity: N/A	**Density/Specific Gravity:** N/A	
Amount Per Container: See table 1	**Flash Point:** N/A	
Net Weight: See table 1		

PACKAGED COMMODITY USED FOR TEST:	
Name: SIDEWINDER, AIM-9G/H/L/M	**Physical State:** Solid
Consistency: N/A	**Density/Specific Gravity:** N/A
Test Pressure (Liquids Only): N/A	**Net Weight:** 372 kg (820 pounds) each
Additional Description: The net weight includes the current maximum commodity weight plus an additional 27 kg (60 pounds)	

N/A = Not Applicable

TABLE 1
Commodities Approved for Shipping in the CNU-287/E Shipping and Storage Container

NALC/ DODIC	NSN	Commodity Nomenclature	Packing Drawing Number	Haz Class/Div	UN Number	Units/ Cntr	Total Net Weight (lb)	Total Gross Weight (lb)
FW62	6920-01-061-8673	Guided Missile Training	PN 639AS2750	1.4C	0276	4	640	1,120
FW63	6920-01-061-8676	Guided Missile Training	PN 639AS7250	1.4C	0276	4	640	1,120
FW64	6920-01-061-8674	Guided Missile Training	PN 639AS2750	1.4C	0276	4	640	1,120
FW65	6920-01-061-8677	Guided Missile Training	PN 639AS2750	1.4C	0276	4	753	1,233
PC60	1410-01-201-8546	Guided Missile Prac, CATM-9M-2	PN 639AS2750	1.4C	0276	4	753	1,233
PC61	1410-01-200-8108	Guided Missile Prac, CATM-9M-2	PN 639AS2750	1.4C	0276	4	753	1,233
PC62	1410-01-201-4024	Guided Missile Prac, NATM-9L-2	PN 639AS2750	1.3C	0183	4	753	1,233
PC64	1410-01-201-4021	Guided Missile Prac, NATM-9M-1	PN 639AS2750	1.1E	0181	4	753	1,233
PC65	1410-01-201-4022	Guided Missile Prac, NATM-9M-2	PN 639AS2750	1.3C	0183	4	753	1,233
PB55	1410-01-139-1741	Guided Missile Prac, AIM-9M-1	PN 639AS2750	1.1E	0181	4	640	1,120
PC47	1410-01-268-6970	Guided Missile Prac, AIM-9M	PN 639AS2750	1.1E	0181	4	760	1,240
PA72	1410-01-056-9405	Guided Missile Prac, AIM-9L	PN 639AS2750	1.1E	0181	4	760	1,240